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MECHANISM AND VITALISM

THE recent work[1] of Driesch propounding a vitalistic theory has been the object of much discussion. While appreciation of the detailed analysis of those phenomena which are claimed to be peculiarly vitalistic has generally been expressed, criticism has been directed upon the fundamental contention and the argument upon which it is based. This contention is that certain phenomena of living nature are of such a character that a physicochemical explanation of them is inconceivable. Besides pointing out certain obvious inconsistencies in the presentation, the critics, as would naturally be expected, have in the main endeavored to establish the conceivability and even possibility of a physicochemical explanation of the processes in question, by pointing out their analogy to other mechanical facts, both of organic and of inorganic nature. Thus the biologist has been and will be incited to further analysis and more exact research in the field under investigation. To a lesser extent attention has been called to the vagueness and inadequacy of the notion of mechanism employed and to the nature of its implied contrast with vitalism. Now it may be that a keener appreciation of these notions will show that at the basis of the more apparent discrepancies lies a fundamental confusion in methodology. The attempt to carry over one kind of interpretation into a realm where it is inapplicable must entail disastrous effects; and the effort to harmonize the results thus caused may be a hidden source of the more obvious confusions. The consideration of mechanical or physicochemical explanation and, more specifically, the nature of its contrast with a vitalistic theory, will be the subject of this essay. If the result obtained should tend to point out the only consistent method of procedure in the biological field under discussion, it would assist in the removal of an obstacle to the proper direction of scientific effort.

Now it will serve our purpose to present very briefly the essence of the argument in favor of vitalism given in the work under consideration. It is maintained not only that there are certain processes in organic nature which are incapable of being resumed under physicochemical laws or described in terms of mechanics (for the present let us suppose these two predicates interchangeable), but also that any such aim involves a false ideal of science. One main support of this contention is based upon the phenomenon of restitutions. The complicated process of normal morphogenesis, although many of its manifestations call for the assertion of a different agency, may be conceived to have a machine as its basis. But the case of restitutions, the production of a normal organism despite disturbances in the embryo or germ, is in its very nature a violation of a mechanical process. And for what reason? With the reply we approach what we regard as the logic of mechanical explanation. Mechanism involves the principle that similar effects must be produced by similar causes. In restitutions, however, different causes are observed to bring about the same results. A normal embryo produces a normal organism; an embryo altered in certain ways also produces a normal organism. Such a process is therefore essentially incomprehensible in physicochemical terms, and requires the positing of a factor of another order to explain its nature. (For the sake of simplicity we may disregard the positive content of this factor.) Obviously the force of this reasoning is dependent upon the meaning attached to the idea of cause. Now the only significance which the conception of cause, considered as the fundamental principle of physicochemism, may have, is that events must be conceived to be conditioned by certain other facts, or, more generally, there is a factor of determination in processes called mechanical. This is the hypothesis which is involved in mechanical explanation. But, it must be observed, such a conception of cause is not serviceable for concrete analysis. For here the specific facts in which the relation is supposed to inhere are themselves the object of investigation. Again, if we state the matter in another way and say that identity of antecedent and consequent is the underlying general principle, then it is the task of science to discover the particular occurrences to which this identity must pertain.

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[1] "The Science and Philosophy of the Organism."

Has not Driesch been blind to the distinction between the general import of cause and the particular illustrative case? In the assertion that in restitutions there is a violation of the mechanical principle of causation there is the assumption that the only determining fact of a normal organism is a normal embryo. Therefore if a changed normal embryo results in a normal organism, we have an instance of the same effects following from different causes, and mechanism is not only inconceivable but contradicted. To this we object that the normal embryo may conceivably contain elements unessential to the production of a normal organism. It is towards the discovery of the essential factors or specific causes that the efforts of the critics are largely directed.

The only justification for designating a process as mechanically inconceivable is the characterization of it as essentially indeterminate. Such a description of the phenomena in question is not only without evidence, but is contradicted by the discovery of laws governing restitutions. For peculiar alterations of certain embryos are shown to result in specific organisms. These processes are found to be calculable and must be denoted determinate. The function of investigation is to discover the particular factors which are the instruments in the determination. Through repeated experiment the laws governing restitutions have been formulated, and these laws assert the fact of physicochemical processes. We can and do predict the character of the changes in restitutions in the same sense in which we predict variations in normal morphogenesis. Normal morphogenesis and restitutions attest the fact that the accidental elements have not yet been distinguished from the essential, and thus the ultimately causal is yet to be sought.

The question whether bodies exist which are essentially indeterminate is a problem for solution. It may be a task of biology to locate just where, if at all, in the scale of life, an activity must be regarded as arbitrary. But the argument above, or any train of thought following a similar line, not only has not proved vitalism for the case in question, but has led to the conclusion that mechanical explanation is the only one to be consistently desired in the interest of science.

It must be noted further that observation of spatial processes can never give ground for the assertion that a portion of matter is essentially indeterminate or inconceivable mechanically. The most that can be affirmed on this score is that all attempts to comprehend the variations have failed. And, I take it, it is sympathy with this view that has led to the opinion that "the scientific analysis of psychic phenomena must be sought in physicochemical laws."[2] But such a theory, in addition to barring out the peculiarly psychic (if this term has a meaning which is not physiological), is not demanded by the logic of events. Its value for the biologist lies in its employment as a working hypothesis in investigations whose ideal is to approach the limit of mechanical activity in the organic world. It is not herein denied that from other sources there may come evidence which shall lead us to regard an activity as arbitrary.

And the existence of activities which can not be regarded as irresistible is in no way inconsistent with the tenets of mechanism or with the universality of its most general principle, the conservation of energy. For mechanism may be comprehended as applicable to a restricted sphere of nature in which the law of causation obtains. It is limited to that field in which determination is the fundamental postulate.

Now if we turn our attention to a search for the motive which has inspired the theory of vitalism, the following passages are suggestive: "Wherever there is life in the universe something happens which is not present in the given mechanical constellation as such. Something is introduced, not changing the quantitative side, but changing the actuality and direction of mechanical events." Again, "Though of course to deny the logical necessity of a vitalistic conception of biological facts does not imply the impossibility of vitalistic agents being actually at work in them." That is, if these two modes of description are applicable to the same process, it must be that different aspects of one process are denoted. Attention is directed to a quality of a mechanical process. Morphogenesis is a phenomenon which is physicochemically comprehensible, and this description of it does not rob it of such features as the greatness of its complexity and the fact that this complexity makes for the production of a being capable of entering into such relations with its environment as tend to maintain its existence. These characteristics mark its distinction from inorganic occurrences. The unity in the process, the relation of part and whole, does not make it more non-mechanical than many inorganic processes, and this so-called "regulative" feature has been discovered to be precisely the underlying assumption of mechanical explanation. In the phenomena of restitution, the still more apparent fact of adaptation dependent upon a greater degree of complexity has been the logical basis for designating the processes as essentially non-mechanical.

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[2] Jacques Loeb, "Die Bedeutung der Tropismen für die Psychologie."

If the view just sketched be correct, then Driesch's main contention has been reduced to denoting the very different qualitative descriptions of certain physicochemical processes. The profitable contributions of the theory of vitalism are these: it has emphasized the peculiarity, in respect of their results, of specific physicochemical processes, and it has thereby directed attention to the significance of the physicochemical process itself. But the interpretation of such problems does not belong to the restricted sphere of biological explanation and, being confused with the narrower questions, has justly aroused vehement protest on the part of scientific investigators.

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REVIEWS AND ABSTRACTS OF LITERATURE

The World a Spiritual System. JAMES H. SNOWDEN. New York: The Macmillan Company. 1910. Pp. 310.

The present work is an outline of metaphysics avowedly for the uninitiated. Pervaded as it is with a genial dogmatism, confessedly loose in argument, and punctuated with citations from the poets, it would be easy for the professional philosopher (if such there be) to view it askance. The style is not only untechnical, it is often highly rhetorical and at times